Remarks

The Office Action mailed November 9, 2005 and the Advisory Action mailed January 20, 2006 have been carefully reviewed and the foregoing amendment has been made in consequence thereof.

Claims 1, 3-11, 13-20, and 24 are now pending in this application. Claims 1, 3-11, and 13-20 are rejected. Claims 2, 12, and 21-23 are canceled without prejudice, waiver, or disclaimer. Claim 24 has been newly added. Claims 1, 10, 11, 17, and 20 have been amended. No new matter has been added. No fees are due for the newly added claim.

The rejection of Claims 1, 3-11, and 13-20 under 35 U.S.C. § 103(a) as being unpatentable over Possin et al. (U.S. Patent No. 6,167,110) in view of Hu et al. (U.S. Patent No. 5,510,622) and Cusano (U.S. Patent No. 4,187,427) is respectfully traversed.

Possin et al. describe a system including a light-guiding scintillator, such as a fiber optic scintillator (34). A spatial resolution is provided in part by the fiber optic scintillator that has a relatively large number of optical fibers per diode (column 6, lines 9-12). The fiber optic scintillator is being optically coupled to at least one of a plurality of sensor elements such that the sensor element is disposed at one end of a plurality of optical fibers (column 10, lines 35-39). The fiber optic scintillator is disposed to absorb x-ray radiation incident on the fiber bundles and direct at least a portion of a plurality of optical photons generated in an absorption event along an optical axis of fibers in a vicinity of the absorption event (column 10, lines 49-53).

Hu et al. describe a two-dimensional array of detector elements in which individual detector elements in adjacent rows, or columns, or both rows and columns are altered to reduce an effective detector pitch along one or both dimensions of a detector array without reducing a surface area of a detector (column 1, lines 55-60). The pitch is reduced along one dimension by translating alternate rows or columns of detector elements one-half the length of a detector element along that dimension (column 1, lines 59-62).

Cusano describes a plurality of wall members and collimator members (12, 14, and 16) formed from a rigid material (column 3, lines 41-43). Prior to assembly, or after, internal surfaces of the wall and collimator members are coated with an optically reflective material so that light generated by a plurality of scintillator bodies placed within a plurality of volumes defined, is eventually directed to a plurality of photoelectrically responsive detectors (18) (column 3, lines 43-49).

Claim 1 recites a radiation detector, the radiation detector comprising "a first array comprising a first photon incident surface; a second array comprising a second photon incident surface; and a scintillator array extending from said first photon incident surface to said second photon incident surface, wherein said first and second arrays are separated from each other by said scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, said first and second arrays are located within the same radiation detector, wherein the offset is formed with respect to an axis of said scintillator array."

None of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest a radiation detector as recited in Claim 1. Specifically, none of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest the first and second arrays are separated from each other by the scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, the first and second arrays are located within the same radiation detector, where the offset is formed with respect to an axis of the scintillator array. Rather, Possin et al. describe a fiber optic scintillator. The fiber optic scintillator has a relatively large number of optical fibers per diode and provides a spatial resolution. A description of the fiber optic scintillator in Possin et al. does not describe or suggest the offset that is formed with respect to an axis of the scintillator array, where the offset is approximately one-half detector pitch normal to an incident x-ray direction. Hu et al. describe a detector having a detector pitch. The pitch is reduced along one dimension by translating alternate rows or columns of detector elements one-half the length of a detector element along that dimension. A description, in Hu et al., of alternate rows or columns of detector elements that are translated one-half the length of a detector element along that dimension does not describe or suggest the offset that is formed with respect to an

axis of the scintillator array. Cusano describes a plurality of photoelectrically responsive detectors that receive light generated by a plurality of scintillator bodies. A description of the photoelectrically responsive detectors that receive light generated by a plurality of scintillator bodies in Cusano does not describe or suggest the offset that is formed with respect to an axis of the scintillator array, where the offset is approximately one-half detector pitch normal to an incident x-ray direction. Accordingly, none of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest the first and second arrays are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, where the offset is formed with respect to an axis of the scintillator array. For the reasons set forth above, Claim 1 is submitted to be patentable over Possin et al in view of Hu et al. and Cusano.

Claims 3-9 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 3-9 are considered in combination with the recitations of Claim 1, Applicants submit that Claims 3-9 likewise are patentable over Possin et al in view of Hu et al. and Cusano.

Claim 10 recites a radiation detector, the radiation detector comprising "a first array comprising a first photon incident surface and a plurality of sensor elements having an aperture pitch size; a second array comprising a second photon incident surface and a plurality of sensor elements having the aperture pitch size; and a scintillator array extending from said first photon incident surface to said second photon incident surface, said scintillator array is configured to direct at least a portion of a plurality of optical photons to said first photon incident surface and said second photon incident surface, said scintillator comprising a fiber optic scintillator having a plurality of optical fibers bundled in an array and disposed such that said x-rays are incident on said fiber optic scintillator substantially perpendicular to a respective optical axis of said plurality of optical fibers, said fiber optic scintillator further being optically coupled to at least two of said sensor elements such that said sensor elements are disposed at both ends of the plurality of optical fibers, wherein said first and second array sensor elements are separated from each other by said scintillator array and are offset from each other by approximately one-half the aperture pitch size, said

first and second array sensor elements are located within the same radiation detector, wherein the offset is formed with respect to an axis of said scintillator array."

None of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest a radiation detector as recited in Claim 10. Specifically, none of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest the first and second array sensor elements are separated from each other by the scintillator array and are offset from each other by approximately one-half the aperture pitch size, the first and second array sensor elements are located within the same radiation detector, where the offset is formed with respect to an axis of the scintillator array. Rather, Possin et al. describe a fiber optic scintillator. The fiber optic scintillator has a relatively large number of optical fibers per diode and provides a spatial resolution. A description of the fiber optic scintillator in Possin et al. does not describe or suggest the offset that is formed with respect to an axis of the scintillator array, where the offset is approximately one-half the aperture pitch size. Hu et al. describe a detector having a detector pitch. The pitch is reduced along one dimension by translating alternate rows or columns of detector elements one-half the length of a detector element along that dimension. A description, in Hu et al., of alternate rows or columns of detector elements that are translated one-half the length of a detector element along that dimension does not describe or suggest the offset that is formed with respect to an axis of the scintillator array. Cusano describes a plurality of photoelectrically responsive detectors that receive light generated by a plurality of scintillator bodies. A description of the photoelectrically responsive detectors that receive light generated by a plurality of scintillator bodies in Cusano does not describe or suggest the offset that is formed with respect to an axis of the scintillator array, where the offset is approximately one-half the aperture pitch size. Accordingly, none of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest the first and second array sensor elements are offset from each other by approximately one-half the aperture pitch size, where the offset is formed with respect to an axis of the scintillator array. For the reasons set forth above, Claim 10 is submitted to be patentable over Possin et al in view of Hu et al. and Cusano.

Claim 11 recites a method for fabricating a radiation detector, the method comprising "fabricating a first array including a first photon incident surface; fabricating a second array including a second photon incident surface; positioning a scintillator array between the first array and the second array such that the scintillator extends from the first photon incident surface to the second photon incident surface; and placing, within the same radiation detector, the first and second arrays such that the arrays are separated from each other by the scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, wherein the offset is formed with respect to an axis of the scintillator array."

None of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest a method for fabricating a radiation detector as recited in Claim 11. Specifically, none of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest placing, within the same radiation detector, the first and second arrays such that the arrays are separated from each other by the scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, where the offset is formed with respect to an axis of the scintillator array. Rather, Possin et al. describe a fiber optic scintillator. The fiber optic scintillator has a relatively large number of optical fibers per diode and provides a spatial resolution. A description of the fiber optic scintillator in Possin et al. does not describe or suggest the offset that is formed with respect to an axis of the scintillator array, where the offset is one-half detector pitch normal to an incident x-ray direction. Hu et al. describe a detector having a detector pitch. The pitch is reduced along one dimension by translating alternate rows or columns of detector elements one-half the length of a detector element along that dimension. A description, in Hu et al., of alternate rows or columns of detector elements that are translated one-half the length of a detector element along that dimension does not describe or suggest the offset that is formed with respect to an axis of the scintillator array. Cusano describes a plurality of photoelectrically responsive detectors that receive light generated by a plurality of scintillator bodies. A description of the photoelectrically responsive detectors that receive light generated by a plurality of scintillator bodies in Cusano does not describe or suggest the offset that is formed with respect to an axis of the scintillator array, where the offset is

approximately one-half detector pitch normal to an incident x-ray direction. Accordingly, none of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest placing the first and second arrays such that the arrays are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, where the offset is formed with respect to an axis of the scintillator array. For the reasons set forth above, Claim 11 is submitted to be patentable over Possin et al in view of Hu et al. and Cusano.

Claims 13-19 depend, directly or indirectly, from independent Claim 11. When the recitations of Claims 13-19 are considered in combination with the recitations of Claim 11, Applicants submit that Claims 13-19 likewise are patentable over Possin et al in view of Hu et al. and Cusano.

Claim 20 recites a method for fabricating a radiation detector, the method comprising "fabricating a first array including a first photon incident surface including a plurality of sensor elements including a plurality of photosensor devices; fabricating a second array including a first photon incident surface including a plurality of sensor elements including a plurality of photosensor devices; positioning a scintillator array between the first array and the second array such that the scintillator extends from the first photon incident surface to the second photon incident surface, the scintillator array is configured to direct at least a portion of a plurality of optical photons to the first photon incident surface and the second photon incident surface, the scintillator including a fiber optic scintillator including a plurality of optical fibers bundled in an array and disposed such that the x-rays are incident on the fiber optic scintillator substantially perpendicular to a respective optical axis of the plurality of optical fibers, the fiber optic scintillator further being optically coupled to at least two of the sensor elements such that the sensor elements are disposed at both ends of the plurality of optical fibers; and placing, within the same radiation detector, the first and second arrays such that the arrays are separated from each other by the scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, wherein the offset is formed with respect to an axis of the scintillator array."

None of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest a method for fabricating a radiation detector as recited in Claim 20. Specifically, none of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest placing, within the same radiation detector, the first and second arrays such that the arrays are separated from each other by the scintillator array and are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, where the offset is formed with respect to an axis of the scintillator array. Rather, Possin et al. describe a fiber optic scintillator. The fiber optic scintillator has a relatively large number of optical fibers per diode and provides a spatial resolution. A description of the fiber optic scintillator in Possin et al. does not describe or suggest the offset that is formed with respect to an axis of the scintillator array, where the offset is one-half detector pitch normal to an incident x-ray direction. Hu et al. describe a detector having a detector pitch. The pitch is reduced along one dimension by translating alternate rows or columns of detector elements one-half the length of a detector element along that dimension. A description, in Hu et al., of alternate rows or columns of detector elements that are translated one-half the length of a detector element along that dimension does not describe or suggest the offset that is formed with respect to an axis of the scintillator array. Cusano describes a plurality of photoelectrically responsive detectors that receive light generated by a plurality of scintillator bodies. A description of the photoelectrically responsive detectors that receive light generated by a plurality of scintillator bodies in Cusano does not describe or suggest the offset that is formed with respect to an axis of the scintillator array, where the offset is approximately one-half detector pitch normal to an incident x-ray direction. Accordingly, none of Possin et al., Hu et al., or Cusano, considered alone or in combination, describe or suggest placing, the first and second arrays such that the arrays are offset from each other by approximately one-half detector pitch normal to an incident x-ray direction, where the offset is formed with respect to an axis of said scintillator array. For the reasons set forth above, Claim 11 is submitted to be patentable over Possin et al in view of Hu et al. and Cusano.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1, 3-11, and 13-20 be withdrawn.

Moreover, Applicants respectfully submit that the Section 103 rejection of Claims 1, 3-11, and 13-20 is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. None of Possin et al., Cusano, or Hu et al., considered alone or in combination, describe or suggest the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to combine Possin et al. with Cusano or Hu et al. because there is no motivation to combine the references suggested in the cited art itself.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Possin et al. teach a fiber optic scintillator. The fiber optic scintillator has a relatively large number of optical fibers per diode and provides a spatial resolution. Hu et al. teach a detector having a detector pitch. The pitch is reduced along one dimension by translating alternate rows or columns of detector

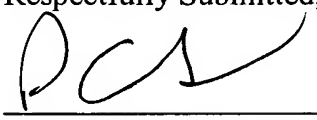
elements one-half the length of a detector element along that dimension. Cusano teaches a plurality of photoelectrically responsive detectors that receive light generated by a plurality of scintillator bodies. Since there is no teaching nor suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejections of Claims 1, 3-11, and 13-20 be withdrawn.

For at least the reasons set forth above, Applicants respectfully request that the rejections of Claims 1, 3-11, and 13-20 under 35 U.S.C. 103(a) be withdrawn.

Newly added Claim 24 depends from independent Claim 1, which is submitted to be in condition for allowance and is patentable over the cited art. For at least the reasons set forth above, Applicants respectfully submit that Claim 24 is also patentable over the cited art.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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